MDH:PB
III-8

DEPARTMENT OF COMMERCE
BUREAU OF STANDARDS
Washington

Letter
Circular
LC 271

Information Section
Bureau of Standards, Washington

October 28, 1929

PUBLICATIONS RELATING TO FRICTION AND LUBRICATION

Bureau of Standards publications are designated by the symbols S (Scientific Papers), T (Technologic Papers), C (Circulars), M (Miscellaneous), LC (Letter Circulars), and RP (Research Papers, superseding S and T beginning in July, 1928). Publications marked with a star are out of print, but may be consulted at the leading libraries. Bureau publications not starred may be purchased from the Superintendent of Documents, Government Printing Office, Washington, D. C., at the prices stated (stamps not accepted), except Letter Circulars, which can be obtained free of charge from the Bureau of Standards, Washington, D. C., as long as available.

Articles by members of the Bureau Staff appearing in outside publications are also listed. These can generally be consulted in the larger technical libraries or obtained by addressing the publishers. Photostat copies may be purchased from the Engineering Societies Library, 29 West 39th Street, New York, N. Y.

The following abbreviations have been used in connection with outside publications: A.S.M.E. = American Society of Mechanical Engineers (29 West 39th Street, New York, N. Y.);

LC271

APM = Applied Mechanics Division and MSP = Machine Shop Practice Division of that Society; A.S.T.M. = American Society for Testing Materials (1315 Spruce St., Philadelphia, Pa.); A.P.I. = American Petroleum Institute (250 Park Ave., New York, N. Y.); S.A.E. = Society of Automotive Engineers (29 West 39th St., New York, N. Y.).

Consecutive reference numbers have been assigned to facilitate the use of the author and subject indices which will be found at the end of this Letter Circular.

CHRONOLOGICAL LIST

Ref. No.	Author	Title and Reference
		1910
1	Waters, C.E.	Action of sunlight and air upon some lubricating oils. S 153.*
2	" "	Behavior of high boiling mineral oils on heating in air. S 160, 5c.
3	Hersey, M.D.	Resistance, inductance and capacity of eccentric cylinders. Elect. World, vol. 56, pp. 434-436.
		1911
4	Waters, C.E.	Effect of added fatty and other oils upon carbonization of mineral lubricating oils. T 4.*

Ref. No.	Author	Title and Reference
5	Waters, C.E.	Evaporation test for mineral lubricating and transformer oils. T 13.*
6	-----	Testing of materials; lubricating oils and greases, pp. 68-72. C 45.*

1914

Ref. No.	Author	Title and Reference
7	Smith, W.H. & Tuttle, J.B.	Iodine number of linseed and petroleum oils. T 37.*
8	Hersey, M.D.	Laws of lubrication of horizontal journal bearings (experimental). Jour. Wash. Acad. Sci., vol. 4, pp. 542-552.

1915

Ref. No.	Author	Title and Reference
9	Hersey, M.D.	On the laws of lubrication of journal bearings (mathematical). Trans. A.S.M.E., vol. 37, pp. 167-202.
10	Herschel, W.H.	Discussion of paper by M. D. Hersey, "On the laws of lubrication of journal bearings." Trans. A.S.M.E., vol. 37, pp. 199-200.

1916

Ref. No.	Author	Title and Reference
11	Herschel, W.H.	The lubricating value of oils. Oil, Paint, and Drug Reporter, Apr. 17, p. 36 R.
12	" "	Design of a water brake. Power, July 25, p. 133; Eng. News, Aug. 24, p. 378.
13	Buckingham, E.	Notes on the theory of efflux viscosimeters, Jour. Wash. Acad. Sci., vol. 6, p. 154.

Ref. No.	Author	Title and Reference
14	Herschel, W.H.	Discussion of paper by E. Buckingham, "Notes on the theory of efflux viscosimeters." Jour. Wash. Acad. Sci., vol. 6, p. 155.
15	Hersey, M.D.	Theory of the torsion and rolling ball viscosimeters, and their use in determining the effect of pressure on viscosity. Jour. Wash. Acad. Sci., vol. 6, pp. 525-530.
16	Waters, C.E.	Data on oxidation of automobile cylinder oils. T 73.*
17	Bingham, E.C.	An investigation of laws of plastic flow. S 278, 10c.
18	Bearce, H.W. & Peffer, E.L.	Density and thermal expansion of American petroleum oils. T 77.*
19	-----	U. S. Standard Baume hydrometer scales. C 59.*
20	Walker, P.H.	Some technical methods of testing miscellaneous supplies; lubricating oils, pp. 57-59. M 15, 15c.
21	Herschel, W.H.	Quantitative test for resistance of lubricating oils to emulsification. Proc. A.S.T.M., vol. 16, pt. 2, pp. 248-272.
22	" "	Testing of lubricating oils. Oildom, vol. 6, Dec., p. 590.

1917

Ref. No.	Author	Title and Reference
23	Herschel, W.H.	The testing and standardization of lubricating oils. Oil, Paint, and Drug Reporter, vol. 91, Feb. 9, p. 14.

Ref. No.	Author	Title and Reference
24	Herschel, W.H.	Resistance of an oil to emulsification. T 86, 10c.
25	Bingham, E.C. & Jackson, R.F.	Standard substances for the calibration of viscometers. S 298.*
26	Herschel, W.H.	Determination of absolute viscosity by short tube viscosimeters. T 100.*
27	" "	Determination of absolute viscosity by the Saybolt Universal and Engler viscosimeters. Proc. A.S.T.M., vol. 17, pt. 2, pp. 551-570.

1918

Ref. No.	Author	Title and Reference
28	Herschel, W.H.	The Standard Saybolt Universal viscosimeter. Proc. A.S.T.M., vol. 18, pt. 2, pp. 363-372.
29	" "	Discussion of paper by E. C. Bingham, "The variable pressure method for the measurement of viscosity." Proc. A.S.T.M., vol. 18, pp. 384-386.

1919

Ref. No.	Author	Title and Reference
30	Herschel, W.H.	Standardization of the Saybolt Universal viscosimeter. T 112, 10c.
31	" "	Viscosity of gasoline. T 125.*
32	" "	A viscosimeter for gasoline. Proc. A.S.T.M., vol. 19, pt. 2, pp. 676-686.
33	Washburn, F.M.	Constant temperature still head for light oil fractionation. T 140, 5c.

Ref. No.	Author	Title and Reference
		1920
34	Herschel, W.H.	Saybolt viscosity of blends. T 164.*
35	Walker, P.H.	Slushing oils. T 176, 5c.
36	Waters, C.E.	Sulfur in petroleum oils. T 177.*
37	" "	Carbonization of lubricating oils. C 99, 10c.
38	Herschel, W.H.	The MacMichael viscosimeter. Jour. Ind. Eng. Chem., vol. 12, pp. 282-286
39	" "	The Saybolt viscosity of oil blends. Chem. & Met. Eng., vol. 22, pp. 1109-1112.
40	" "	Discussion of Report of Sub-Committee on Emulsification. Proc. A.S.T.M., vol. 20, pp. 424-426.
41	Wood, K. D.	A variable speed fan dynamometer. Nat. Adv. Com. for Aeronautics, Wash., D. C., Tech. Note No. 26.
		1921
42	Whittemore, H.L., & Petrenko, S.N.	Friction and carrying capacity of ball and roller bearings. T 201, 10c.
43	Bingham, E.C.	Cutting fluids. T 204, 15c.
44	Waters, C.E.	The catalytic oxidation of petroleum oils. Jour. Ind. Eng. Chem., vol. 13, pp. 901-903.
45	James, W.S.	Elements of automobile fuel economy. Jour. S.A.E., vol. 8, pp. 543-562.

Ref. No.	Author	Title and Reference
46	Herschel, W.H. & Dean, E.W.	Use of MacMichael viscosimeter in testing petroleum products. Bur. Mines Report of Investigations, Serial No. 2201.
47	Buckingham, E.	Plastic flow through capillary tubes. Proc. A.S.T.M., vol. 21, pp. 1154-1161.
48	Herschel, W.H.	The flow through short tubes. Trans. Am. Soc. Civil Engs., vol. 84, pp. 527-550.
49	" "	Report of Sub-Committee V on viscosity. Proc. A.S.T.M., vol. 21, p. 362.

1922

Ref. No.	Author	Title and Reference
50	Herschel, W.H.	Viscosity and friction. Jour. S.A.E., vol. 10, pp. 31-41, 369-372; Trans. S.A.E., vol. 17, pt. 1, pp. 282-320.
51	" "	The Redwood viscometer. T 210, 10c.
52	Wormely, P.L. & Holt, W.L.	Power losses in automobile tires. T 213, 5c.
53	Herschel, W.H. & Anderson, A.H.	Reclamation of used petroleum lubricating oils. T 223, 5c.
54	Von Ammon, S.	Developing a method for testing brake linings. Jour. S.A.E., vol. 10, pp. 153-162.
55	Herschel, W.H.	The change in viscosity of oils with the temperature. Jour. Ind. Eng. Chem., vol. 14, pp. 715-723.
56	" "	The drainage error in the Bingham viscometer. Comparison of viscosities by the Scott viscometer and plummet method of Basseches. Jour. Opt. Soc. Am. Rev. Sci. Instruments, vol. 6, pp. 875-898.

Ref. No.	Author	Title and Reference
57	Herschel, W.H.	Fuel oil viscosimeters. Chem. Met. Eng., vol. 26, pp. 1175-1177.
58	Waters, C.E.	Sulfur compounds and oxidation of petroleum oils. Jour. Ind. Eng. Chem., vol. 14, pp. 725-727.
59	Hersey, M.D.	Note on a general method for determining properties of matter. Jour. Wash. Acad. Sci., vol. 12, pp. 167-172. (Viscosity measurement, pp. 168-169).
60	Herschel, W.H. (Chairman)	Report of Sub-Committee V on viscosity. Proc. A.S.T.M., vol. 22, pp. 423-424.
61	Bingham, E.C.	Fluidity and plasticity. (With bibliography). New York: McGraw-Hill.
		1923
62	Herschel, W.H.	Testing oiliness by friction-testing machines. Chem. Met. Eng., vol. 28, pp. 302-303.
63	" "	Friction testing of lubricating oils. Chem. Met. Eng., vol. 28, pp. 594-598.
64	" "	Testing lubricating oils for quality. Proc. Eng. Soc. West. Penn., vol. 38, pp. 503-514 (with bibliography).
65	Von Ammon, S.	An investigation of heavy duty truck drive axles. Jour. S.A.E., vol. 12, pp. 517-534.
66	James, W.S.	Decelerometer for testing automobile brakes. Jour. S.A.E., vol. 13, pp. 499-501.

Ref. No.	Author	Title and Reference
67	Herschel, W.H.	The improved MacMichael viscosimeter. Jour. Opt. Soc. Am. Rev. Sci. Instruments, vol. 7, pt. I, pp. 335-353.
68	" "	Bath temperatures of viscosimeters of the Saybolt type. Ind. Eng. Chem., vol. 15, pp. 945-946.
69	Hersey, M.D.	Problems of lubrication research. Jour. Am. Soc. Naval Eng., vol. 35, pp. 648-674.
70	" "	Viscosity of lubricants at high pressure and temperature. Rep. Internat. Air Congress, London, pp. 549-551.
71	" "	Discussion of paper by H.A.S. Howarth "A graphical study of journal lubrication," Trans. A.S.M.E., vol. 45, pp. 439-440.
72	Herschel, W.H. (Chairman)	Report of Sub-Committee XIII on organic acidity and saponification. Proc. A.S.T.M., vol. 23, pt. 1, pp. 376-377.
73	James, W.S.	Service tests of lubricants in internal combustion engines. Bull. A.P.I., vol. 4, Dec. 31, 1923, pp. 132-141.

1924

Ref. No.	Author	Title and Reference
74	Chase, H.	Bureau of Standards improves brake lining test apparatus. Automotive Industries, vol. 50, pp. 136-137.
75	-----	National standard petroleum oil tables. (Supersedes C 57). C 154, 30c.
76	Eisinger, J.O.	Factors affecting the rate of crankcase oil dilution. Jour. S.A.E., vol. 15, pp. 69-74.

Ref. No.	Author	Title and Reference
77	Hersey, M.D.	A study of the oxygen oil explosion hazard, Jour. Am. Soc. Naval Eng., vol. 36, pp. 231-243.
78	Dickinson, H.C.	Heat and power research in petroleum. Oil and Gas Jour., vol. 23, Aug. 7, pp. 41, 110.
79	Sligh, T.S., Jr.	A practical test by oxidation to determine the stability of mineral oil. Power, vol. 60, p. 551.
80	" "	An oxidation method for measuring the stability of mineral oils. Proc. A.S.T.M., vol. 24, pt. 2, pp. 964-974.
81	" "	Measurement of crankcase dilution. Vacuum distillation transition method. Bull. A.P.I., vol. 5, pp. 122-126.
82	Herschel, W.H. (Chairman)	Report of Sub-Committee V on viscosity. Proc. A.S.T.M., vol. 24, pt. 1, pp. 522-523.
83	" "	Report of Sub-Committee XIII on organic acidity and saponification. Proc. A.S.T.M., vol. 24, pp. 543-544. (See also vol. 28, p. 436).
84	Herschel, W.H. & Bulkley, R.	Consistency of rubber-benzene solutions. Ind. Eng. Chem., vol. 16, p. 927.
85	-----	Report of Committee on Viscosity Standards (Cooperative investigation, A.P.I. and U. S. Bur. Standards). Am. Petrol. Inst., 250 Park Ave., New York City.
86	Hersey, M.D. & Wetzel, H.E.	Mine car friction as influenced by wheel diameter and other variables. (U. S. Bur. Mines cooperative investigation). Bull. 13, Carnegie Inst.,Tech.,Pgh.,Pa.

Ref. No.	Author	Title and Reference
87	Hersey, M.D.	Discussion of paper by L. N. Linsley, "An investigation of the critical bearing pressures causing rupture in lubricating oil films." Trans. A.S.M.E., vol. 46, p. 879.

1925

Ref. No.	Author	Title and Reference
88	Sligh, T.S., Jr.	Vacuum distillation transition method. Oil and Gas Jour., vol. 23, Jan. 8, pp. 126-128.
89	" "	Contamination of crankcase oils in service. Oil and Gas Jour., vol. 23, May 14, pp. 151-162.
90	" "	Crankcase dilution measurement. Oil and Gas Jour., vol. 23, May 21, p. 127.
91	" "	Oxidation important in lubrication. Oil and Gas Jour., vol. 24, June 4, pp. 125-135.
92	" "	Measuring the percentage of crankcase dilution. Jour. S.A.E., vol. 16, pp. 355-360; LC 200.
93	-----	Note on flask failures in the oxidation test. LC 175.
94	-----	Abridged volume correction table for petroleum oils. (Supplement to B. S. Circular C 154). 5c.
95	Marvin, C.F., Jr.	A machine for comparing the lubricating properties of oils at high pressures. Jour. S.A.E., vol. 17, pp. 287-289.
96	Herschel, W.H. & Bulkley, R.	The Ostwald viscometer as a consistometer. J. Phys. Chem., vol. 29, pp. 1217-1223.

Ref. No.	Author	Title and Reference
97	Griffin, H.K.	Density of a lubricating oil at temperatures from -40° to +20°C. Ind. Eng. Chem., vol. 17, pp. 1157-1160.
98	-----	Motor lubricating oils. LC 170.
99	-----	Research associates at the Bureau of Standards. C 296, 10c.
100	Hersey, M.D., Golden, P.L., Shore, H., & Downes, M.S.	Mine car friction with six types of trucks. (U. S. Bureau of Mines cooperative investigation). Bull. 20, Carnegie Institute of Technology, Pgh., Pa.

1926

Ref. No.	Author	Title and Reference
101	Dickinson, H.C.	Government purchase of lubricants on a quality basis. Bull. A.P.I., vol. 7, pp. 136-142.
102	Herschel, W.H.	Chapter on consistency in Jerome Alexander's compilation, "Colloid Chemistry," vol. 1, pp. 727-737, New York: Chemical Catalog Co.
103	Kanolt, C.W.	Nonflammable liquids for cryostats (V. Measurement of viscosity, pp. 627-631). B. S. Sci. Papers, vol. 20, pp. 619-633; S 520, 10c.
104	McKee, S.A.	The effect of the addition of kerosene on the oiliness of lubricating oils. Jour. S.A.E., vol. 19, pp. 356-360; Trans. S.A.E., vol. 21, pt. II, pp. 248-261.
105	Sparrow, S.W. & Eisinger, J.O.	Lubrication data from Cooperative Fuel Research. Ind. Eng. Chem., vol. 18, pp. 482-485.
106	Hersey, M.D.	Lubricants. Proc. Railway Club of Pgh., vol. 25, pp. 174-183.

Ref. No.	Author	Title and Reference
107	Herschel, W.H.	Viscosity and temperature changes. Oil and Gas Jour., vol. 25, Dec. 2, pp. 146, 150, 176, 178, 182, 184.
108	Herschel, W.H. & Bulkley, R.	Measurement of consistency as applied to rubber-benzene solutions. Proc. A.S.T.M., vol. 26, pt. 2, pp. 621-633. (Published in full as "Konsistenzmessungen von Gummi-Benzollösungen," Kolloid Zeit., vol. 39, pp. 291-300).
109	Herschel, W.H.	Technical efflux viscometers; interpolation and interconversion of readings. International Critical Tables, vol. 1, pp. 32-33. New York: McGraw-Hill.
110	-----	General policy of the Bureau of Standards with regard to testing. LC 209.

1927

Ref. No.	Author	Title and Reference
111	-----	Directory of commercial testing and college research laboratories. M 90, 15c.
112	Herschel, W.H. & Bulkley, R.	Calibration of the buret consistometer. Ind. Eng. Chem., vol. 19, pp. 134-139.
113	McKee, S.A.	Performance characteristics of journal bearings when an abrasive is in the lubricant. Jour. S.A.E., vol. 20, Sect. 1, pp. 3-6; Trans. S.A.E., vol. 22, pt. I, pp. 73-77.
114	Allen, H.H.	Frictional properties of brake linings. Jour. S.A.E., vol. 20, pp. 77-82.

Ref. No.	Author	Title and Reference
115	Sparrow, S.W. & Thorne, M.A.	Friction of aviation engines. Report No. 262, Nat. Adv. Com. for Aeronautics, Washington, D. C.
116	Herschel, W.H.	Conditions of flow into the vertical capillary tube of the Saybolt thermoviscometer. Ind. Eng. Chem., vol. 19, pp. 837-840.
117	" "	Discussion of paper by C. Terzaghi, "The methods and possibilities of road-soil investigations." Proc. 6th An. Meet. Highway Research Board, pp. 413-416.
118	Shepherd, M. & Ledig, P.G.	Rubber stopcock lubricants. Ind. Eng. Chem., vol. 19, pp. 1059-1061.
119	McKee, S.A.	The effect of running in on journal bearing performance. Mech. Eng., vol. 49, pp. 1335-1340; vol. 50, pp. 528-533.
120	French, H.J., Rosenberg, L.J., Harbaugh, W.LeC., Cross, H.C.	Wear and mechanical properties of railroad bearing bronzes at different temperatures. Bur. Stds. Jour. Research, vol. 1, pp. 343-421; RP 13, 35c.
121	French, H.J.	Wear testing of metals. Proc. A.S.T.M., vol. 27, pt. 2, pp. 212-234.
122	Herschel, W.H. (Chairman)	Report of Sub-Committee I on petrolatum. Proc. A.S.T.M., vol. 27, pt. 1, pp. 448-449.

1928

Ref. No.	Author	Title and Reference
123	Hersey, M.D. (Chairman)	Progress in lubrication research (with bibliography). Report of A.S.M.E. Special Research Committee on Lubrication. Trans. A.S.M.E. APM-50-4; Mech. Eng., vol. 50, pp. 682-683.

Ref. No.	Author	Title and Reference
124	Hersey, M.D. & Shore, H.	Viscosity of lubricants under pressure. Mech. Eng., vol. 50, pp. 221-232.
125	Hersey, M.D.	Work of the Bureau of Standards on friction and lubrication. U. S. Daily, June 14, p. 11; Mech. Eng., vol. 50, p. 594.
126	French, H.J.	Wear and mechanical tests of some railroad bearing bronzes. Proc. A.S.T.M., vol. 28, pt. 2, pp. 298-325, 348-355.
127	Du Bois, R.N.	Lubrication of aircraft engines. (Discussion of paper by Wilkin, Oak and Barnard, "Motor oil characteristics and performance at low temperatures." Jour. S.A.E., vol. 23, pp. 381-382).
128	Herschel, W.H.	Discussion of paper by Wilson, R.E., and Barnard, D.P., 4th, "The Significance of various tests applied to motor oils." Proc. A.S.T.M., vol. 28, pp. 687-688.
129	Herschel, W.H. (Chairman)	Report of Sub-Committee I on petrolatum. Proc. A.S.T.M., vol. 28, pt. 1, pp. 442-444.

1929

Ref. No.	Author	Title and Reference
130	McKee, S.A. & McKee, T.R.	Friction of journal bearings as influenced by clearance and length. Trans. A.S.M.E. APM-51-15, pp. 161-171; Mech. Eng., vol. 51, p. 593.
131	Hersey, M.D. (Chairman)	Cooling and lubrication of cutting tools (with bibliography). Prog. Rep. No. 1 of Sub-Comm. on Cutting Fluids, A.S.M.E. Spec. Res. Com. on Cutting of Metals. Trans. A.S.M.E. MSP-51-8, pp. 47-58.

Ref. No.	Author	Title and Reference
132	Keulegan, G.H.	Damping liquids for aircraft instruments. Nat. Adv. Com. for Aeronautics, Wash., D. C., Report No. 299.
133	French, H.J. & Staples, E.M.	Bearing bronzes with and without zinc. Bur. Stds. Jour. Research, vol. 2, pp. 1017-1038; RP 68, 15c.
134	Hersey, M.D.	Fundamental action of lubricants. Am. Machinist, vol. 70, June 13 and 20, pp. 919, 975.
135	" "	Viscosity of Diesel engine fuel oil under pressure. Nat. Adv. Com. for Aeronautics, Wash., D. C., Tech. Note No. 315.
136	-----	Fundamental research on lubrication. Bur. Standards Technical News Bull. No. 148, August, pp. 73-76; Jour. Franklin Inst., vol. 208, Sept., pp. 422-426.
137	Hersey, M.D.	Effect of small changes in temperature on the properties of bodies. Bur. Stds. Jour. Research. (In press).
138	" "	Some lubrication developments. Trans. A.S.M.E. MSP vol. 51, No. 3.
139	McKee, S.A.	Progress on efficiency tests of electric street car trucks. Proc. Am. Elect. Ry. Eng. Assoc. (In press).
140	" "	Present practice in the use of cutting fluids. Prog. Rep. No. 2 of Sub-Com. on Cutting Fluids, A.S.M.E. Sp. Res. Com. on Cutting of Metals. Preprint for presentation at Annual Meeting, 29 W. 39th St., New York, N. Y.
141	Herschel, W.H.	Multiple bulb consistometer. Jour. of Rheology, vol. 1, Oct., pp. 68-75.

Author Index

The numbers following the names of the authors are the same as the reference numbers in the first column of the preceding chronological list.

A

Allen, H.H. 114

Anderson, A.H. 53

B

Bearce, H.W. 18

Bingham, E.C. 17, 25, 43, 61

Buckingham, E. 13, 47

Bulkley, R. 84, 96, 108, 112

C

Chase, H. 74

Cross, H.C. 120

D

Dean, E.W. 46

Dickinson, H.C. 78, 101

Downes, M.S. 100

Du Bois, R.N. 127

E

Eisinger, J.O. 76, 105

F

French, H.J. 120, 121, 126, 133

G

Golden, P.L. 100

Griffin, H.K. 97

H

Harbaugh, W. LeC. 120

Herschel, W.H. 10, 11, 12, 14, 21, 22, 23, 24, 26, 27, 28, 29, 30, 31, 32, 34, 38, 39, 40, 46, 48, 49, 50, 51, 53, 55, 56, 57, 60, 62, 63, 64, 67, 68, 72, 82, 83, 84, 96, 102, 107, 108, 109, 112, 116, 117, 122, 128, 129, 141

Hersey, M.D. 3, 8, 9, 15, 59, 69, 70, 71, 77, 86, 87, 100, 106, 123, 124, 125, 131, 134, 135, 137, 138

H

Holt, W.L. 52

J

Jackson, R.F. 25

James, W.S. 45, 66, 73

K

Kanolt, C.W. 103

Keulegan, G.H. 132

L

Ledig, P.G. 118

M

Marvin, C.F., Jr. 95

McKee, S.A. 104, 113, 119, 130, 139, 140

McKee, T.R. 130

P

Peffer, E.L. 18

Petrenko, S.N. 42

R

Rosenberg, L.J. 120

S

Shepherd, M. 118

Shore, H. 100, 124

Sligh, T.S., Jr. 79, 80, 81, 88, 89, 90, 91, 92

Smith, W.H. 7

Sparrow, S.W. 105, 115

Staples, E.M. 133

T

Thorne, M.A. 115

Tuttle, J.B. 7

V

Von Ammon, S. 54, 65

W

Walker, P.H. 20, 35

Washburn, F.M. 33

Waters, C.E. 1, 2, 4, 5, 16, 36, 37, 44, 58

Wetzel, H.E. 86

Whittemore, H.L. 42

Wood, K.D. 41

Wormely, P.L. 52

Subject Index

Automotive friction losses: 45 - 52 - 115

Automotive lubrication: 73 - 89 - 98 - 105 - 127

Ball and roller bearings: 42 - 86 - 100

Bearing alloys: See "Wear" and "Oiliness."

Bibliographies: 42 - 61 - 64 - 86 - 100 - 102 - 123 - 131 - 136 - 138

Brakes and brake linings: 54 - 66 - 74 - 114

Carbonization and evaporation of oils: 4 - 5 - 37

Committee Reports: 40 - 49 - 60 - 72 - 82 - 83 - 85 - 122 - 123 - 129 - 131

Consistency: See "Plasticity."

Consistometers: 61 - 84 - 96 - 102 - 108 - 112 - 141

Cutting fluids: 43 - 95 - 131 - 140

Density (including thermal expansion): 18 - 19 - 75 - 94 - 97

Dilution: 76 - 81 - 90 - 92 - 105

Dimensional analysis of lubrication: 8 - 9 - 69 - 104 - 106 - 113 - 119 - 130

Dynamometers: 12 - 41 - 139

Effect of pressure on viscosity: 15 - 69 - 70 - 123 - 124 - 134 - 135

Effect of temperature on viscosity: 55 - 107 - 134

Emulsification of oils: 21 - 24 - 40

Friction (general): 50 - 63 - 86 - 100 - 125 - 136

Gear testing: 65 - 125 - 139

Journal bearings: 3 - 8 - 9 - 10 - 71 - 87 - 104 - 113 - 119 - 130 - 134 - 137

Low temperature tests: 97 - 103 - 127 - 132

Lubricants (general): 11 - 106 - 118 - 122 - 129 - 134

Lubrication (general): 50 - 69 - 78 - 105 - 134 - 138

Mathematical theory: 3 - 8 - 9 - 10 - 15 - 59 - 71 - 138

Miscellaneous: 33 - 35 - 132 - 137

Oiliness: 10 - 50 - 62 - 69 - 95 - 104 - 123 - 124 - 128 - 134

Oxidation of oils: 1 - 2 - 7 - 16 - 44 - 58 - 77 - 79 - 80 - 91 - 93

Plasticity: 17 - 47 - 61 - 84 - 96 - 102 - 108 - 112 - 117 - 122 - 129 - 141

Rerefining (reclamation) of used oils: 53

Research (general): 69 - 78 - 99 - 105 - 106 - 123 - 125 - 134 - 136 - 138

Rolling friction: 52 - 86 - 100

Specific gravity: See "Density."

Standardization of viscometers: 25 - 28 - 30 - 85 - 109 -

Sulphur in oils: 36 - 58

Testing of lubricants: 6 - 20 - 22 - 23 - 63 - 64 - 72 - 73 - 83 - 88 - 101 - 110 - 111 - 128

Viscometers (general): 13 - 14 - 15 - 26 - 27 - 28 - 29 - 30 - 32 - 38 - 46 - 48 - 51 - 56 - 57 - 67 - 68 - 96 - 109 - 116

Viscosity (general): 26 - 27 - 31 - 34 - 39 - 49 - 50 - 59 - 60 - 82 - 103 - 132

Wear: 120 - 121 - 126 - 133

ZN/P: See "Dimensional Analysis."